Evaluation of instructive texts on searching medical databases EC

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Medical specialists, students, and other health professionals often have to search the literature for answers to medical questions. Medical libraries have long offered mediated search services that require librarians with thorough search skills. In the literature, several instructive texts can be found on how to created good searches, but how effective are they? Is there a gold standard for searching?

Some widely used guidelines such as the PRESS instrument or the PRISMA statement are not instructive; they only allow checking the completeness of an existing search strategy. The Cochrane handbook [1] is frequently used and cited when constructing a systematic review, but is it instructive enough to create a good search strategy? PubMed and other websites and databases have published extensive online tutorials with descriptions of their databases and specific search methods. Which sources are needed for creating a solid search strategy, and are they enough to create a thorough search for systematic reviews, for instance?

METHODS

I performed a structured search in January 2015 in several databases. My aim was to find instructive articles for either medical personnel or medical librarians on how to find literature on a medical topic. Articles that mentioned topics of interest in the process of creating a search strategy were scored in a table. These topics were not predefined but grew as the body of texts grew. My inclusion criteria were that the texts had to be instructive and aimed at either medical professionals or librarians.

RESULTS

Of the 3,665 unique records, 37 articles met the inclusion criteria, and scanning the reference lists identified 15 additional references. All references to included texts can be found in Table 1, online only. Most references were journal articles, but 6 books were also found to be relevant. Major topics identified in these texts were: search preparation, search basics, thesaurus, interface use, optimization, and further use and personalization. A full overview of all topics and the scores of the individual articles can be found in Table 2, online only.

Search preparation

Many texts include instructions on how to frame the research question so that it is clear and answerable before starting a search, such as the use of patient/problem, intervention, comparison, outcome (PICO) or another acronym, but a warning is given much less often that not all elements of PICO should be used for search strategies. The importance of choosing databases and collecting synonyms is often stressed.

Search basics

Almost every article describes the use of Boolean operators to construct search logic; however, fewer warn against the use of "NOT" in exhaustive searches. More than half of all reviewed articles explain how truncation can be used, but only a few warn about the dangers that lie in PubMed's limit of 600 word variants. Many articles instruct on field codes and proximity operators, but these differ with interface and database.

Thesaurus

Almost every article mentions the use of thesaurus terms, and more than half of them explain the strength of the tree structure. The danger of searching only thesaurus terms—missing recent articles—is explained in only a few articles, and the fact that many more terms can be found in a thesaurus (such as entry terms or synonyms) is largely ignored.

Interface use

For the use of specific features of the interfaces, one can best refer to the manual of that interface. Instructive texts do not add much value to manuals.

EC Supplemental Table 1 and Table 2, which includes the full reference list of reviewed texts, are available with the online version of this journal.

Advanced use and personalization

Topics that go further than the standard search options—such as exporting references, asking librarians for help, or saving searches to create alerts and customization of the interface—are explained much less often than the other topics.

Exhaustive search and optimization

A topic that the reviewed articles mostly ignored is the possibility of optimization to create an extensive search strategy (e.g., for systematic reviews). Some describe how a result set can be narrowed or broadened to optimize sensitivity or specificity or how terms from already retrieved articles can be added to the existing search strategy. However, a truly practical approach to create a thorough search strategy is still missing.

DISCUSSION

There is great diversity in the quality of the reviewed texts. Many texts are available that are poorly written and will not be of much value for those seeking instruction on how to search systematically. Others are more complete and well written but lack coverage of important features of the search process.

It is questionable whether the topics found in these combined texts are enough to create truly exhaustive searches that find every article for a systematic review. Certain methods and tricks many other experienced searchers and I have used are not mentioned in any article, such as the use of entry terms given in the Medical Subject Headings (MeSH) database as synonyms in a search query.

The results of other, nontraditional methods to create exhaustive searches have been described in the literature, such as using logs of PubMed searches or text-mining tools from known relevant references. However, these methods are not described in a way that is easily replicable by clinicians and librarians, as these methods often require programming knowledge.

The article series by Fatehi et al. (2013–2014) [2–4] aimed at medical professionals covers the most identified topics but lacks a good description of search preparation. The monograph by Jankowski [5] scores highest on that part, although it is written from a librarian point of view. A combination of these 2 texts (together containing 157 pages) along with database-specific manuals would give a searcher a thorough knowledge of the process of creating a good basic search strategy. The Cochrane handbook [1] is not primarily intended as an instructive text for searchers and, thus, does not guide the process thoroughly.

There still is a gap in the literature on how to create truly systematic and exhaustive search strategies for systematic reviews, for instance. No combination of articles provides readers with enough knowledge to guide them through this process. There is a vast need for instructive texts on that topic.

REFERENCES

1. Higgins JPT, Green S. Cochrane handbook for systematic reviews of interventions. Wiley Online Library; 2008.
2. Fatehi F, Gray LC, Wootton R. How to improve your PubMed/MEDLINE searches: 1. background and basic searching. J Telemed Telecare. 2013;19(8):479–86.
3. Fatehi F, Gray LC, Wootton R. How to improve your PubMed/MEDLINE searches: 2. display settings, complex search queries and topic searching. J Telemed Telecare. Jan 2014;20(1):44–55.
4. Fatehi F, Gray LC, Wootton R. How to improve your PubMed/MEDLINE searches: 3. advanced searching, MeSH and My NCBI. J Telemed Telecare. Mar 2014;20(2): 102–12.
5. Jankowski TA. The Medical Library Association essential guide to becoming an expert searcher: proven techniques, strategies, and tips for finding health information. New York, NY: Neal-Schuman Publishers; 2008.

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